

SILICON WAFER AND ITS THERMAL TREATMENT METHOD

Title:
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Abstract

PURPOSE: To provide a thermal treatment method of enhancing an silicon wafer, which is lessened in oxygen concentration around its surface but whose element forming region is lessened in mechanical strength due to a thermal treatment carried out in a hydrogen atmosphere, in mechanical strength.

CONSTITUTION: A silicon wafer subjected to a hydrogen thermal treatment is thermally treated for two hours at a temperature of 1100 deg.C in a nitrogen atmosphere which contains 20% of oxygen, wherein oxygen is introduced close to the polar surface of the silicon wafer. Oxygen concentration is higher in the surface of the wafer than inside it. Oxygen decreases gradually in concentration up to a point located as deep as 3 to 4μm into the wafer and then increases gradually after the point to an inside concentration. A dent is made in the surface of the wafer so as to generate dislocation, which is propagated by a thermal treatment. When the spread of dislocation is measured, it is 1/10 as large as that of a wafer subjected to a hydrogen thermal treatment. By this setup, the device forming region of the wafer can be improved so as to be nearly as equal in mechanical strength as that of a wafer not subjected to a hydrogen thermal treatment.